CLAIMS

1. A method for detecting a target nucleic acid sequence in a sample, characterized in that it comprises: (a) providing two nucleic acid probe sequences which are at least partially complementary to and capable of hybridizing to two adjacent regions of said target sequence; (b) hybridizing said probe sequences to said target sequence under hybridizing conditions; (c) joining said probe sequences with a ligase; d) optionally repeating the steps (b) and (c) one or more times; and (e) detecting the AMP released; wherein the presence or amount of the AMP released is indicative of the presence or amount of said target sequence.

2. A method according to claim 1, wherein said probe sequences hybridize to said target sequence to leave a gap of one or more nucleotides between adjacent probe sequences, and wherein said step (b) further comprises filling said gap by an extension reaction prior to joining said probe sequences.

3. A method according to claim 1 or 2, wherein said ligase is a DNA ligase.

4. A method according to claim 1 or 2, wherein said ligase is DNA ligase (NAD).

5. A method according to claim 1 or 2, wherein the AMP released is detected by enzymatic means.

6. A method according to claim 1 or 2, wherein the AMP released is detected by enzymatic means comprising luciferase and luciferin.

7. A method according to claim 1 or 2, wherein the AMP released is detected by enzymatic means comprising adenylate kinase, nucleoside-diphosphate kinase, dCTP or another phosphate donor, luciferase, and luciferin.

8. A method according to claim 1 or 2, wherein said target sequence is a DNA or RNA sequence.

9. A method according to claim 1 or 2, wherein said two probe sequences are within two separate oligonucleotides.

10. A method according to claim 1 or 2, wherein said two probe sequences are the two free ends of a single oligonucleotide.

11. A method according to claim 1 or 2, wherein said target sequence is in a single-stranded form.

12. A method according to claim 1 or 2, wherein said target sequence is an amplification product.

13. A method according to claim 1 or 2, wherein at least one of said probe sequences is immobilized to a solid phase.

14. A method according to claim 1 or 2, wherein said target sequence is immobilized to a solid phase.

15. A kit for use in a method according to claim 1 or 2, characterized in that it comprises in a packaged combination: (a) a ligase, and (b) AMP detecting means.

16. A kit according to claim 15, wherein said ligase is a DNA ligase.

17. A kit according to claim 15, wherein said ligase is DNA ligase (NAD).

18. A kit according to claim 15, wherein said AMP detecting means is enzymatic means.

19. A kit according to claim 15, wherein said AMP detecting means is enzymatic means comprising luciferase and luciferin.

20. A kit according to claim 15, wherein said AMP detecting means is enzymatic means comprising adenylate kinase, nucleoside-diphosphate kinase, dCTP or another phosphate donor, luciferase, and luciferin.

21. A method for detecting ligase-catalyzed joining of nucleic acid ends, characterized in that it comprises detecting by enzymatic means the AMP released.

22. A method according to claim 21, wherein said ligase is a DNA ligase.

23. A method according to claim 21, wherein said ligase is DNA ligase (NAD).

24. A method according to claim 21, wherein said nucleic acid ends are cohesive complementary ends.

25. A method according to claim 21, wherein said nucleic acid ends are abutting ends on a nucleic acid template.

26. A method according to claim 21, wherein said nucleic acid ends are blunt ends.

27. A method according to claim 21, wherein said enzymatic means comprises luciferase and luciferin.

28. A method according to claim 21, wherein said enzymatic means comprises adenylate kinase, nucleoside-diphosphate kinase, dCTP or another phosphate donor, luciferase, and luciferin.

29. A reagent for detecting ligase-catalyzed joining of nucleic acid ends, characterized in that it comprises enzymatic means for detecting the AMP released.

30. A reagent according to claim 29, wherein said ligase is a DNA ligase.

31. A reagent according to claim 29, wherein said ligase is DNA ligase (NAD).

32. A reagent according to claim 29, wherein said nucleic acid ends are cohesive complementary ends.

33. A reagent according to claim 29, wherein said nucleic acid ends are abutting ends on a nucleic acid template.

34. A reagent according to claim 29, wherein said nucleic acid ends are blunt ends.

35. A reagent according to claim 29, wherein said enzymatic means comprises luciferase and luciferin.

36. A reagent according to claim 29, wherein said enzymatic means comprises adenylate kinase, nucleoside-diphosphate kinase, dCTP or another phosphate donor, luciferase, and luciferin.

37. A kit for detecting ligase-catalyzed joining of nucleic acid ends, characterized in that it comprises, in a packaged combination, enzymatic means for detecting the AMP released.

38. A kit according to claim 37, wherein said ligase is a DNA ligase.

39. A kit according to claim 37, wherein said ligase is DNA ligase (NAD).

40. A kit according to claim 37, wherein said nucleic acid ends are cohesive complementary ends.

41. A kit according to claim 37, wherein said nucleic acid ends are abutting ends on a nucleic acid template.

42. A kit according to claim 37, wherein said nucleic acid ends are blunt ends.

43. A kit according to claim 37, wherein said enzymatic means comprises luciferase and luciferin.

44. A kit according to claim 37, wherein said enzymatic means comprises adenylate kinase, nucleoside-diphosphate kinase, dCTP or another phosphate donor, luciferase, and luciferin.